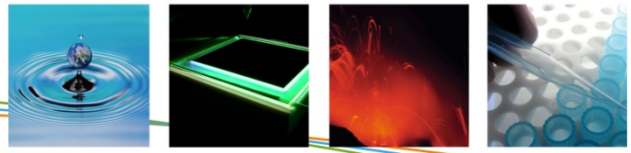
vito
vision on technology



5/4/12

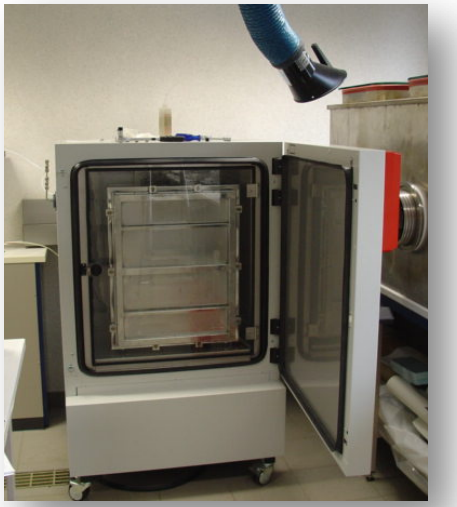
Determining Flame Retardant Emission Factors from Treated Goods

Borislav Lazarov

ESR3

Determining FR emissions from treated goods

» **Test chamber experiments**



vito
vision on technology

Emission test chamber operation

	New draft EN standard	ISO 16000-9	EN 717-1	Frequently used in USA *
Temperature °C	23	23	23	23
Range	± 1	± 2	± 0.5	± 1
Rel.humidity %	50	50	45	50
Range	± 5	± 5	± 3	± 5
Ventilation ach	0.5	0.5	1.0	1.0
Range	0.25 - 1.5	unlimited [2]	± 0.05	± 0.05
Loading factor m^2/m^3 [x]	see below	see below [1]	1.0	0.5
- flooring m^2/m^3	0.4	0.4	-	-
- walls m^2/m^3	1.0	1.4	-	-
- small surfaces m^2/m^3	0.05	-	-	-
- very small surf. m^2/m^3	0.007	0.011	-	-
Range	± 50%, but max 2.0	unlimited [2]	± 0.02	0.3 - 0.7
Air velocity at surface, m/s	0.1 - 0.3	0.1 - 0.3	0.1 - 0.3	0.05 - 0.1 [3]
Test chamber size	min. 20 l	not specified	12m^3, 1 m^3, or 225 l	50 - 100 l

ach: air changes per hour

Determining FR emissions from treated goods

» Test chamber protocols

Building materials
Floor coverage, …e.g. AgBB

Loading factor, test conditions

Consumer products
cleaning agents, personal care, air fresheners, …

Use scenario's, use conditions

Treated goods
consumer electronics, fabrics, …

Loading factor?

Use scenario's?

EPHECT

www.vito.be/ephect

Officair

EN 13419, ASTM D5116, ISO 16000-9, ISO 16000-10, ISO 16000-11

Progress to date

- Getting familiar with the literature on occurrence, sampling and detection methods of FRs
- Training on using emission test chambers – ongoing
- Getting familiar with existed emission testing protocols
- Training on sampling and sample preparation from gas phase – ongoing
- Building a database containing FR, and their physical/chemical properties, relevant for emission testing, occurrence, sampling and detection methods
- Installation and validation of a new test chamber of 0.5 m^3 according to ISO 16000-9

Plans for next 6 months

- Stage 1 of research plan: selecting relevant FR and exploring the applicability of selected methods for sampling and detecting;
- Getting started with Stage 2 of research plan: Selecting of relevant parameters for emission testing, and design different testing scenarios.
- Literature review for developing a procedure for relevant products selection for emission testing.

Thank you for your attention!